KEY CHARACTERISTICS

- ARE QUICKLY BECOMING A BEST COMMERCIAL PRACTICE
- A COMMUNICATIONS TOOL
- FOCUSES RESOURCES IN DESIGN & MFG – BY APPLYING DOE & SPC
- LEADS YOU TO KEY MFG CHARACTERICS
- NOT THE SAME AS A KPP
- Subject matter experts determine what features and processes are key

OTE: Additional information is provided on the notes pages. Either view or int the notes pages for this information, or run as a slide show to hear the presentation.

KEY CHARACTERISTICS

Different organizations have different definitions:

- A PRODUCT FEATURE THAT HAS THE GREATEST AFFECT ON SAFETY, COST, RELIABILITY OR CUSTOMER SATISFACTION
- FEATURES OR CHARACTERISTICS WHOSE VARIABILITY HAS THE GREATEST IMPACT ON FIT, PERFORMANCE, OR SERVICE LIFE OF A FINISHED PART

Other than safety, key characteristics depend on a firm's particular capabilities and experience.

SAE AS9100

Section 3; Terms and Definitions

- "Key characteristics: The features of a material, process or part whose variation has a significant influence on product fit, performance, service life or manufacturability."

Section 7.3.3 Design and development outputs

- e) "shall identify key characteristics, when applicable, in accordance with design or contract requirements."

Section 8.2.4 Monitoring and measurement of product

- " When key characteristics have been identified, they shall be monitored and controlled."

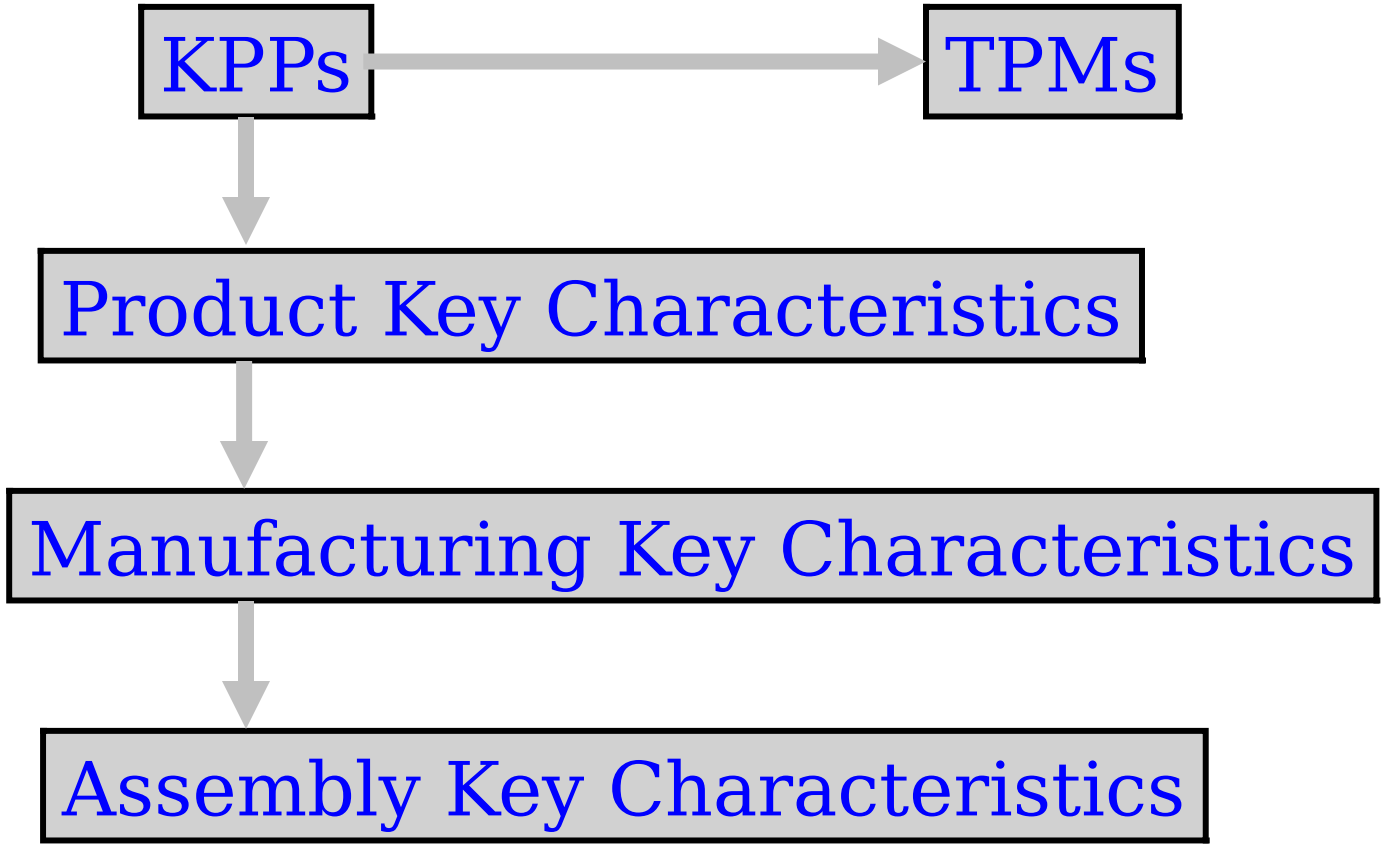
WHY USE KEY CHARACTERISTICS?

- PERFORMANCE AND QUALITY COME FROM REDUCING VARIABILITY OF KCs
- WHERE DO I APPLY KCs?
  - On everything? - NO
  - Which features or functions are most important?
  - How do you identify the most vital features/functions?

safety, reliability, mission essential, cost

KCs are a communications tool and a resource allocation tool

Key Flowdowns



Down Approach for a Digital Clock

CUSTOMER REQ'MTS

- RELIABILITY
- WEIGHT
- PERFORMANCE
- COST

KEY

SYSTEM DESIGN

KEY

- PERFORMANCE

Courtesy Boeing Corp.

SUBSYSTEM DESIGN

CLOCK

READABILITY
ACCURACY

KEY
KEY

POWER SUPPLY

VOLTAGE

KEY

DISPLAY ASSEMBLY

ILLUMINATION

KEY

PHOTO DIODE

LCD

PANEL LAMP

CURRENT

KEY

MANUFACTURING

PROCESS PARAMETERS ← HARDWARE REQ'MTS

SOLDER JOINTS:

- TEMP — KEY
- TIME
- SPEED — KEY
- WAVE HEIGHT
- SOLDER TYPE

KEY

VOLTAGE:

- CAPACITANCE
- CONFORMAL COATING
- RESISTANCE

So Which Car Would You Rather Own?

They look the same….

But, are they?

Same TDP – Different Results

Ford Batavia Plant:

- Ford Escorts were selling so well that Ford had to subcontract the production of transaxles.
- Ford owned 60% of Mazda; they sent them the TDP and had them drop-ship the product to the Ford assembly plant.
- Ford buyers began asking for the Escort with the Mazda transmission. When asked why, customers noted that the Mazda transmission had a reputation for reliability.
- Ford was surprised and began an investigation.

Mazda (Korean) Plant:

- Received the drawings and specifications and accomplished an analysis of the **"Key Characteristics."**
- There are over 10,000 dimensional and other characteristics on a typical transaxle.
- Mazda found that only four (4) of these characteristics were **"key or critical."**
- Mazda used Statistical Process Control to manage those four characteristics.

Summary

- Key Characteristics provide a focus for product improvement
- One measure of quality is conformance to nominal on all key characteristics
- Reduce variation on key characteristics by using statistical

  process control
- The number of key characteristics must be controlled or

  they lose their value